

# Rare earth elements in northern freshwater, marine, and terrestrial ecosystems



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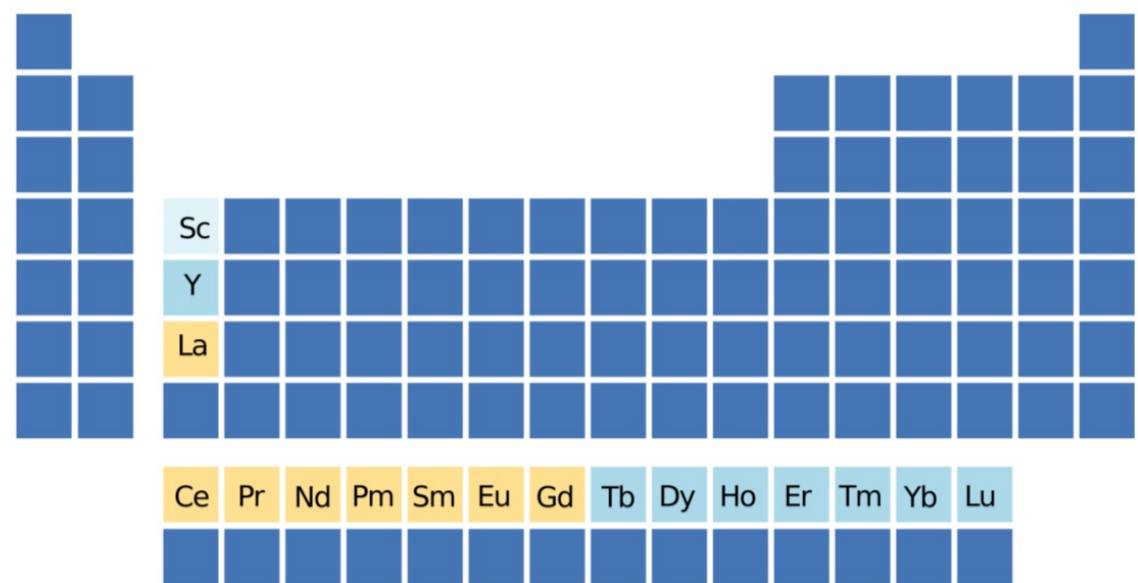
Environment and Climate Change Canada, National Wildlife Research Centre

Arctic Eider Society, Sakkuq Landholding Corporation



## CONTEXT

Rare earth elements (REEs) are a group of 17 metals.



They are not rare nor earths! Just unfamiliar and difficult to extract from minerals.

REE mining has led to significant environment impacts in several countries, yet little is known about these contaminants of emerging interest.



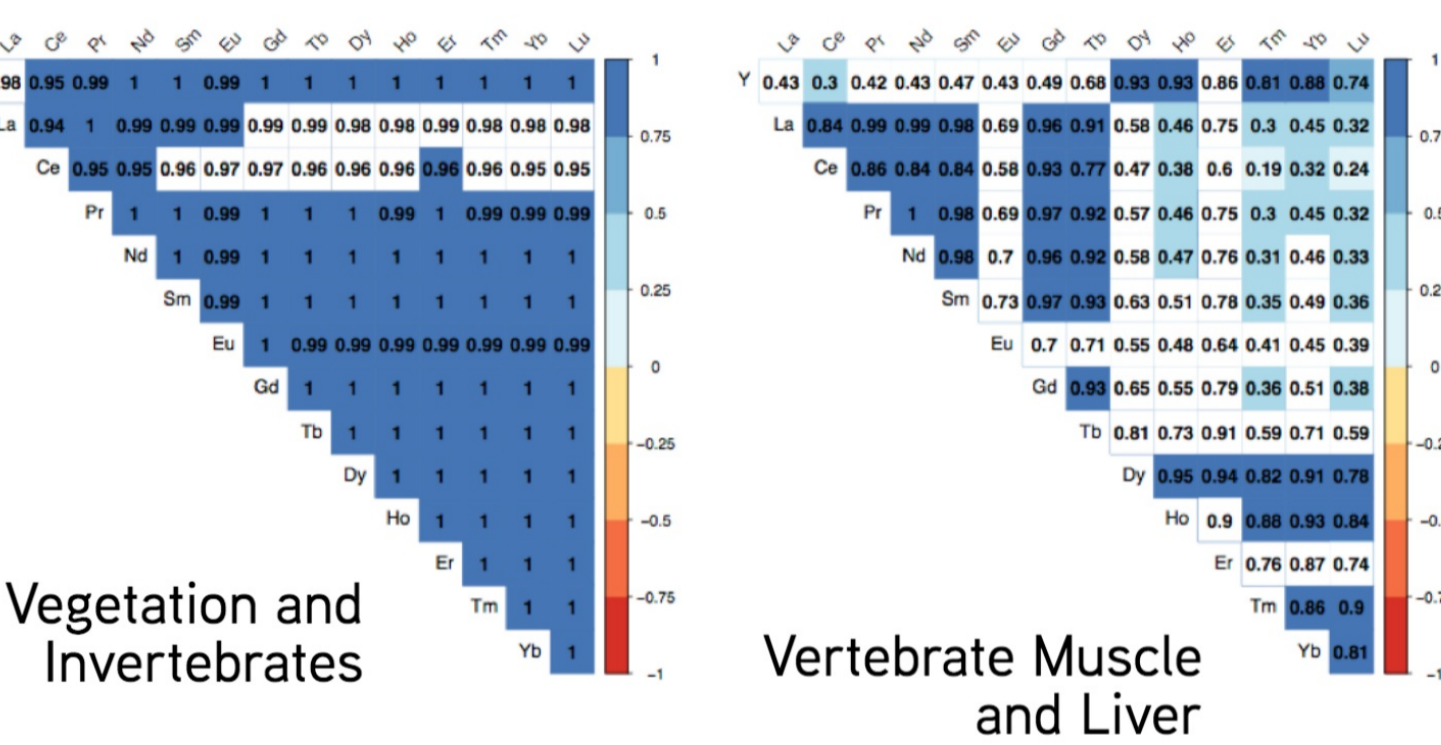
Mountain Pass REE Mine, California

## OBJECTIVE

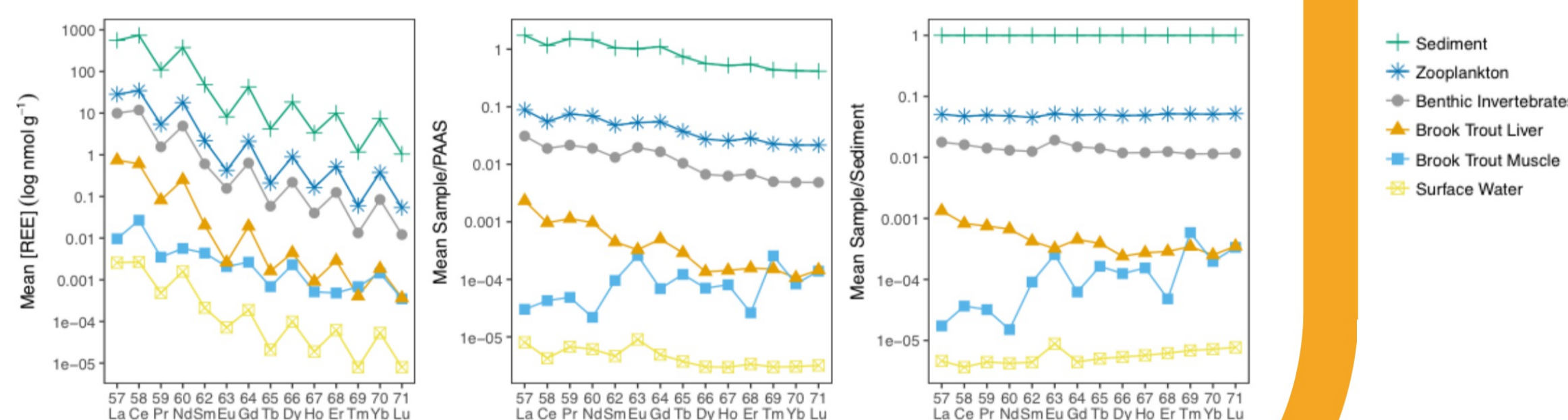
Considering the lack of field studies on REEs and the potential explosion of REE mining activity in the North:

How do REEs behave in northern ecosystems unaffected by mining activities?

Wildlife harvesting was done in collaboration with local hunters through a community-based monitoring project.



15 of 17 REEs were measured in plant & animal tissues. The levels of different REEs were connected (i.e. correlated) in samples. Samples with high levels were high for most REEs.

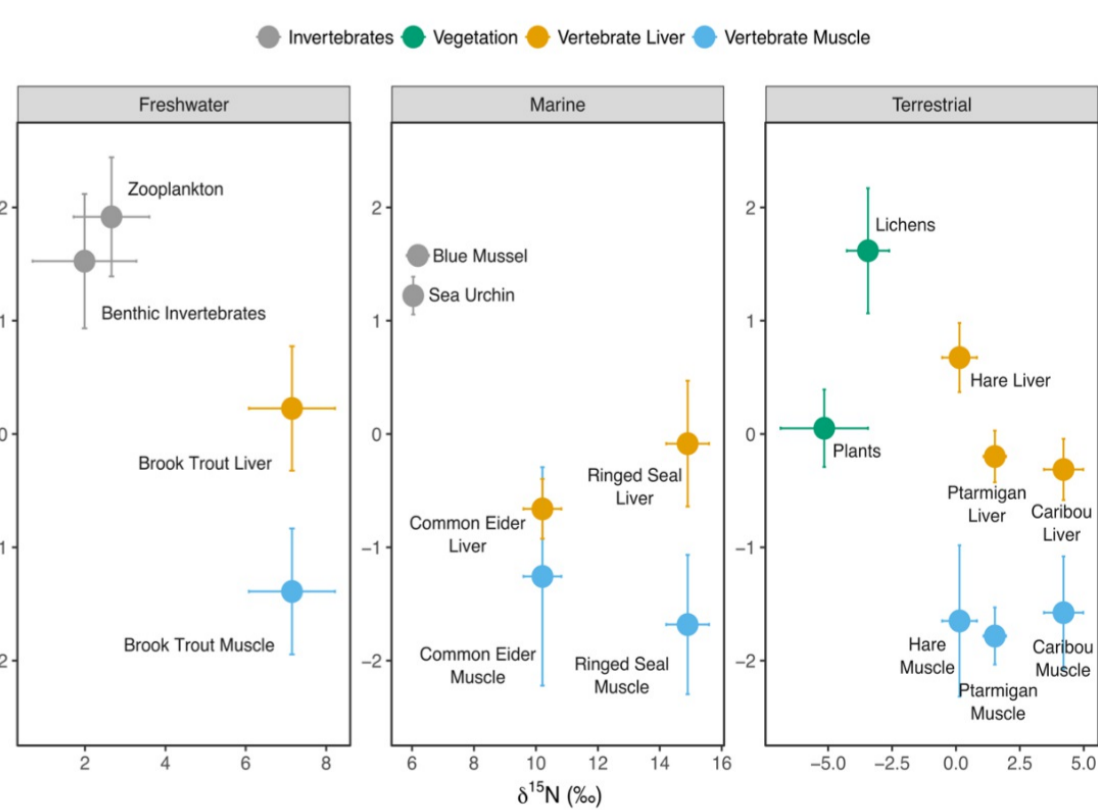


But some REEs behaved a bit differently...

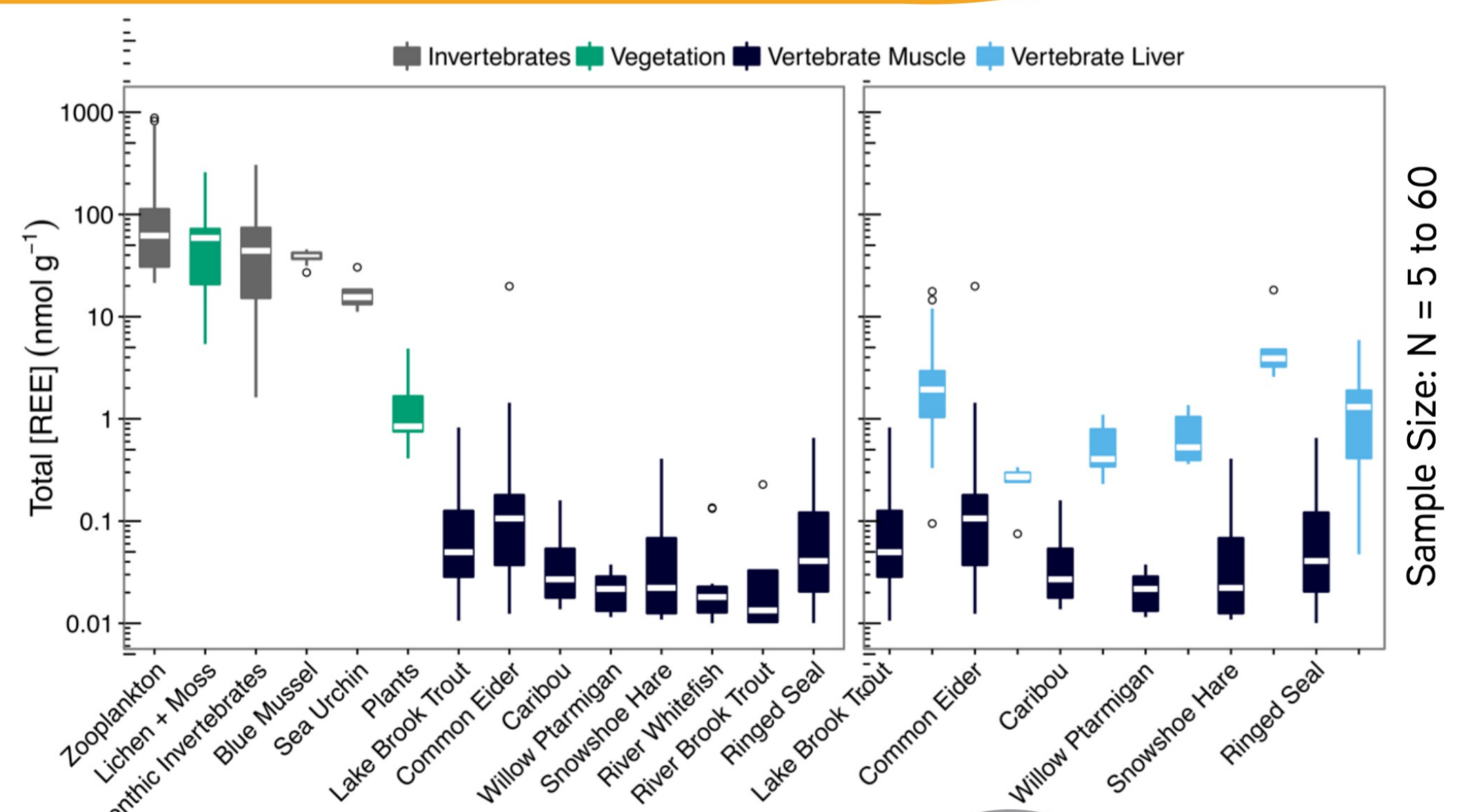
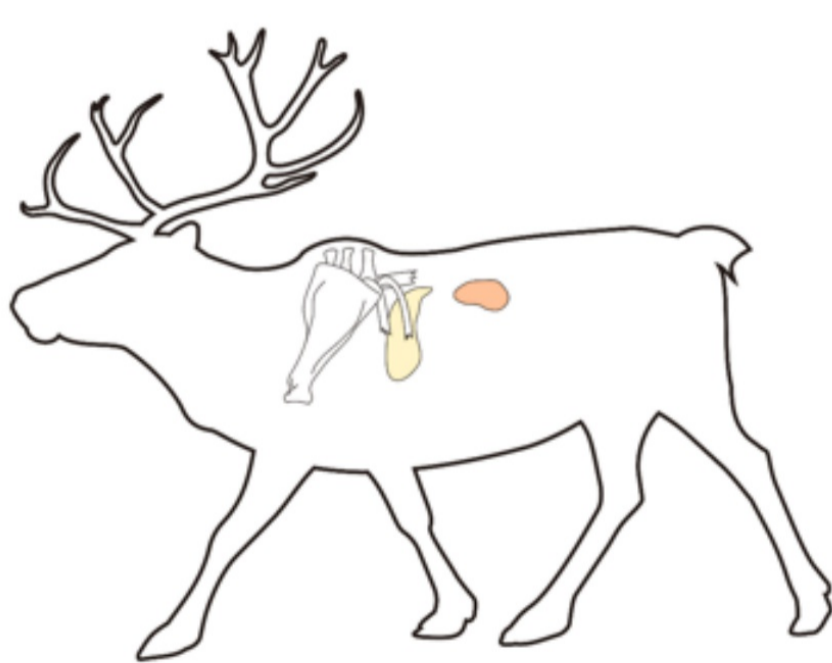
## RESULTS

Highest [REE] at the base of the food web (lichen, moss, and aquatic invertebrates).

[REE] in liver were consistently higher (4 - 200x) than in muscle tissues for all vertebrates.



No REE biomagnification



## CONCLUSIONS

- > First comprehensive field study on REE from northern ecosystems
- > Coherent bioaccumulation pattern but no biomagnification
- > Next: Kangisualujuaq!



Quest Rare Minerals  
Strange Lake Rare Earths Project  
Kangiqsualujuaq, Nunavik, QC